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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,480	06/28/2001	Giuseppe Colombo	05788.0170	2907

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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER	
TSOY, ELENA	

ART UNIT	PAPER NUMBER
1762	17

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/892,480	COLOMBO ET AL.
	Examiner	Art Unit
	Elena Tsoy	1762

-- The MAILING DATE of this communication appears on th cov r sh t with th correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *34-66* is/are pending in the application.

4a) Of the above claim(s) *49-66* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-38,40-42,47 and 48* is/are rejected.

7)☐ Claim(s) *39 and 43-46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Rejection of claims 34, 43, 45 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 34-38, 40-42, 47, 48** stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al (US 4,035,322) in view of Nishida et al (US 6,186,658), and further in view of Hiorth (US 4,191,480).

As to claims 47, 48, Tate et al disclose a method for mixing a liquid curing agent with polyethylene pellets (See column 2, lines 63-64) comprising spraying the liquid curing agent through the pellets having temperature of 50^0C in an addition chamber 14 while the mass is being violently agitated, further mixing the pellets and curing agent in agitation and aging chamber 16 by blowing turbulent air through the pellets for a period of 4-9 hours (mixing and drying) until it is determined by empirical tests that each pellet has been coated with the curing agent, and cooling (further drying) the pellets in a cooler 17 (See column 3, lines 23-35). As a result of the agitation

the curing agent penetrates and diffuses into the pellets through the softened surface layer (See column 3, lines 47-52).

Tate et al fail to teach that mixing the liquid curing agent with polyethylene pellets can be carried out using a method as claimed, i.e. comprising the steps of: a) feeding a substantially continuous flow of the pellets to at least one substantially static spraying chamber, b) spraying the liquid curing agent phase onto the pellets continuously flowing within said spraying chamber, c) passing the pellets partially or totally coated by said substance in liquid phase continuously leaving the spraying chamber, through substantially static mixing means supported in at least one mixing chamber provided downstream of said spraying chamber, so as to submit the pellets to mixing; d) submitting the mixed pellets so obtained to drying for a time sufficient to allow a substantially complete absorption of the substance in liquid phase by the granules (Claim 34); the spraying step is carried out by means of a plurality of injectors supported within the spraying chamber (Claim 37); the continuous flow of the pellets split in a plurality of streams continuously flowing in respective flowpaths defined within the spraying chamber facing each of said injectors (Claim 40).

As to claims 37, 40 and steps a)-c) of claim 34, Nishida et al teach that mixing solid particles with a fluid using an apparatus of the static mixer category, i.e. a mixer in which the mixing occurs in a continuous flow without any moving parts other than the materials themselves, allows to coat the solid particles with the fluid uniformly and rapidly (See column 1, lines 59-67; column 2, lines 1-8). The method comprises the steps of: a) feeding a substantially continuous flow of heated catalyst particles through at least one standpipes (See Figs. 15, 18), spraying the feed stock in the form of fine droplets (See column 2, lines 46-48, 55-56) supplied from a plurality of spraying nozzles 223 (injectors) supported within the spraying chamber (See Figs. 15, 18, 19;

column 11, lines 9, 20) so that the feed stock collides with the particles dispersed outwardly in the radial direction and is further finely scattered by impact upon the collision, so that the feed stock can be mixed uniformly and rapidly with the particles (See Figs. 15, 18; column 12, lines 14), c) passing the catalyst particles partially or totally coated by the feed stock continuously leaving the spraying chamber, through substantially static mixing means 205 and 213 supported in at least one mixing chamber 204 (See Figs. 15, 18; column 11, lines 44-45) provided downstream of said spraying chamber, so as to submit the catalyst particles to further mixing, d) submitting the mixed catalyst particles downwardly to a reactor 212 (See column 12, lines 14-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have mixed heated (to e.g. 50^0C) polyethylene pellets with a curing agent in Tate et al using an apparatus and a method of Nishida et al with the expectation of providing the heated polyethylene pellets with the desired absorbed curing agent uniformly and rapidly since Nishida et al teach that mixing solid particles with a fluid using an apparatus of the static mixer category allows to coat the solid particles with the fluid uniformly and rapidly.

The Examiner Note: Nishida et al is analogous art, since it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Nishida et al is reasonably pertinent to the particular problem with which the applicant was concerned since it offers a method of coating solid particles with a fluid uniformly and rapidly versus a method of Tate et al which requires 4-6 hours of mixing and drying.

One of ordinary skill in the art at would have had high expectation of success of using method and apparatus of Nishida et al for mixing heated (to e.g. 50^0C) polyethylene pellets of Tate et al with a liquid material, since a method of Nishida et al allows mixing heated (to e.g. as high as $450\text{-}470^0$) (See column 12, lines 6-7) solid particles having particle size of 1-500 microns (See column 4, lines 30-31) with a liquid material; and since, as well known in the art, low density porous polyethylene **granules** or **pellets** generally have particle size in the range of 25-2500 microns, as evidenced by Rifi (US 5,076,988, column 1, lines 52-55).

As to claims 35, 36 and step d) of claim 34, Tate et al in view of Nishida et al fail to teach that the drying step is carried out in a drying chamber provided downstream of the mixing zone (Claim 35); the pellets flow by gravity in a substantially continuous manner through said spraying, mixing and drying chambers (Claim 36).

Hiorth teaches that an apparatus of the static mixer category (See column 1, lines 13-17), allowing to obtain a homogeneous mixture of a powder and a liquid material by momentary intermixing of the materials (See column 2, lines 1-2) by continuously passing the powder through a spraying chamber 30 and a mixing chambers 32, can be provided downstream the static mixing chamber 32 with a chamber wherein the mixed powder can be entrained in the air stream and then discharged through the exit 35 (See column 4, lines 42-44).

It is the Examiner's position that the chamber, which is provided with the air stream and positioned downstream the static mixing chamber 32, is in fact a drying chamber because after passing this chamber the mixed powder is in condition to be discharged through the exit, i.e. in a final dry condition.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided an apparatus of Tate et al in view of Nishida et al with a chamber,

downstream the static mixing chamber, wherein mixed pellets can be entrained in the air stream, with the expectation of providing the desired dried mixed pellets since Hiorth teaches that an apparatus of the static mixer category provided with a chamber, downstream the static mixing chamber, wherein the mixed powder can be entrained in the air stream, allows to obtain the mixed powder ready to be discharged, i.e. in dry condition.

The Examiner Note: Hiorth is also analogous art, since it is reasonably pertinent to the particular problem with which the applicant was concerned. Hiorth teaches that the apparatus may be used for coating any powder with any liquid material (See column 1, lines 7-10).

One of ordinary skill in the art at would have had high expectation of success in modifying an apparatus of Tate et al in view of Nishida et al with Hiorth, since it is well known in the art that **polyethylene powders** may have particle size in various ranges including 400 microns, as evidenced by Keizer (US 3,880,803, column 6, lines 40-43) or below 300 microns, or below 80 microns, as evidenced by Bethea et al (US 3,988,296, column 1, lines 13-16) and **polyethylene granules** or **pellets** generally have particle size in the range of 25-2500 microns, as evidenced by Rifi (US 5,076,988, column 1, lines 52-55), i.e. solid particle size of all three references considerably overlap.

As to claim 38, Tate et al in view of Nishida et al, further in view of Hiorth, fail to teach that the droplets of liquid material have a mean diameter of 10-500 microns.

The droplet size is a result-effective parameter in a coating process since too large droplets will cause particles to agglomerate, too small droplets will not coat the particles efficiently.

It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant droplet parameters (including those of claim 38) in a method of Tate et al in view of Nishida et al, further in view of Hiorth through routine experimentation in the absence of a showing of criticality.

As to claim 41, Tate et al further teach that as a result of the agitation the curing agent penetrates and diffuses into the pellets through the softened areas on the pellet surfaces by liquid-liquid diffusion (See column 3, lines 47-53). As would be obvious to one skilled in the art, the higher the working temperature, the shorter the requisite mixing time. However, when the requisite mixing time is shortened only by raising the working temperature the working temperature must not be so high that the curing agent penetrates and diffuses into the pellets before it is uniformly dispersed throughout the pellets which can cause lack of uniformity in the concentration of curing agent penetrating into individual pellets. Further, if the working temperature is set near the softening point of polyethylene the pellets tend to cohere into lumps before or during agitation. See column 4, lines 15-27. In other words, the steps a)-d) should be carried out at a temperature comprised between the melting temperature of the curing agent and the minimum temperature between the softening temperature of the polymer to be impregnated and the temperature at which the substance in liquid phase starts to thermally deteriorate no matter a mixing apparatus of Tate et al alone or the apparatus of Tate et al in view of Nishida et al, further in view of Hiorth is used.

As to claim 42, since method of Tate et al in view of Nishida et al, further in view of Hiorth would be substantially identical to that of claimed invention, total time for carrying spraying and mixing steps would depend on particular materials used.

Allowable Subject Matter

5. Claims 39, 43-46 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments with respect to claims 34-38, 40-42, 47, 48 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (703) 605-1171. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Elena Tsoy

Elena Tsoy
Examiner
Art Unit 1762

April 20, 2003